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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of:	Michael A. O'Neill, et al.	)	Group Art Unit: To Be Assigned
on:	A FIBER-REINFORCED	)	
	COMPOSITE STRUCTURE	)	
Serial No.:	To Be Assigned	)	Examiner: To Be Assigned
Filed On:	Herewith	)	Docket No. 003449.0012

Hartford, Connecticut, October 16, 2001

BOX PATENT APPLICATION  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Preliminary Amendment

Dear Sir:

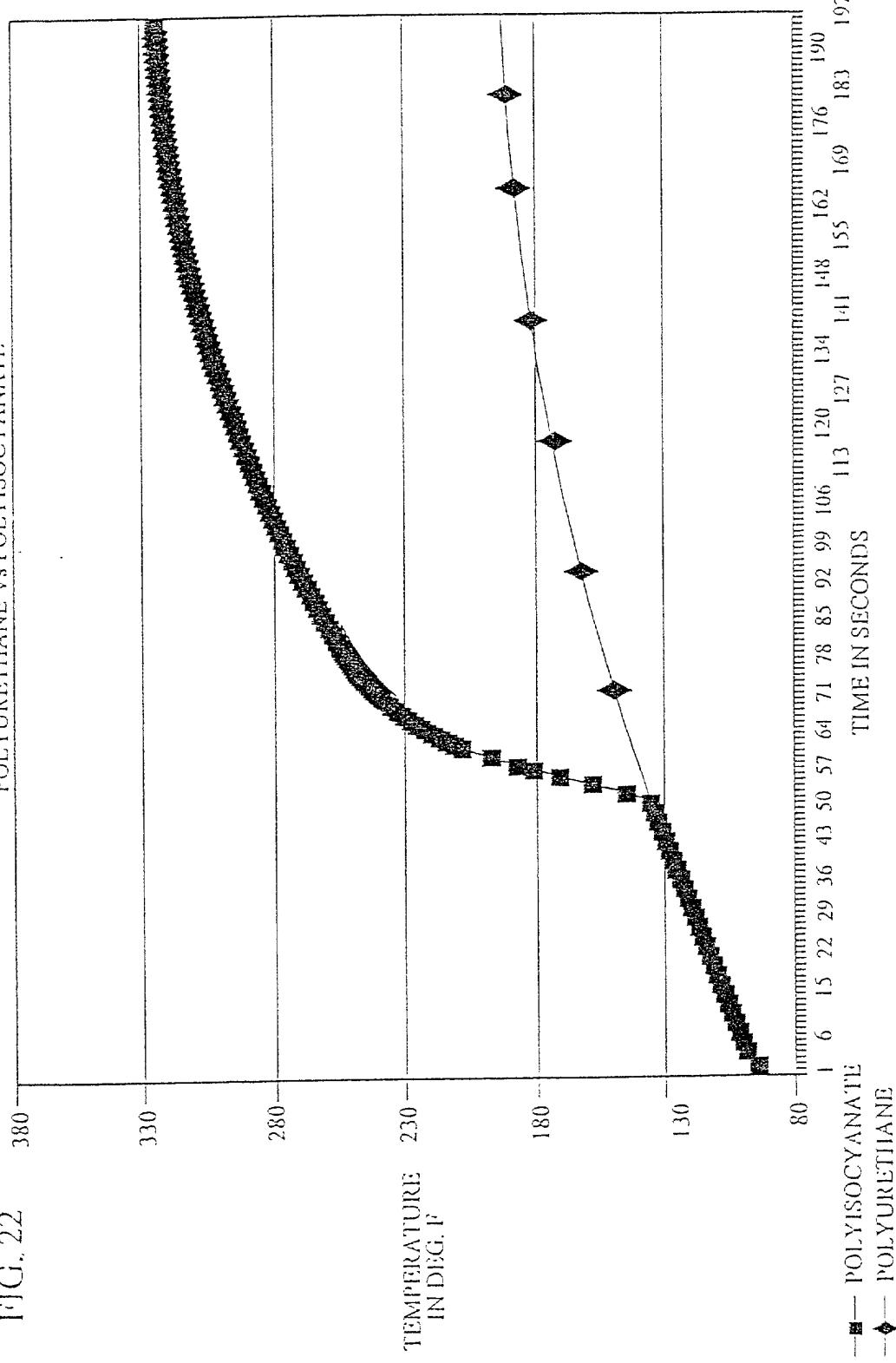
Please amend the above-identified patent application prior to examination and  
calculation of the filing fee as follows:

In the Drawings:

Please add new Figure 22 as follows:

FIG. 22

POLYURETHANE VS POLYISOCYANATE



**In the Specification:**

Please insert a new paragraph with heading, on page 1, after the title as follows:

**Cross-reference to Related Application**

This application claims priority to and is a divisional of U.S. Patent Application No. 09/690,338 to O'Neill et al., filed October 17, 2000, which is incorporated herein by reference.

Please insert a new paragraph, on page 11, after the second full paragraph as follows:

FIG. 22 is a graph illustrating the timing and temperature of the preferred polyisocyanurate core material when undergoing an exothermic reaction upon injection into the core of the composite structure.

Please replace the last paragraph on page 45 with the replacement paragraph as follows:

Accordingly, the components of the polymeric core material 16 are selected such that upon encountering the reduced pressure in the evacuated cavity 148, the blowing agent begins to boil to thereby pre-expand the polymeric core material from a resinous state to a frothing foam. As indicated in FIG. 22, a preferred polymeric core

Please replace the paragraph on page 46 with the replacement paragraph as follows:

material 16, described in further detail below, is a polyisocyanurate that is injected in a resinous state into the cavity 148 at about 85°F. When the polymeric core material 16 encounters the vacuum pressure of the cavity 148, the blowing agent immediately commences boiling and, in turn, causes the foaming resin to promptly fill the second region of the cavity formed between the fibrous layers 14, 14'. As further indicated in

FIG. 22, in less than approximately one minute, the exothermic reaction produces sufficient heat to raise the temperature of the polymeric core material 16 to about 140°F and, in turn, activate the latent catalyst and initiate a catalytic reaction within the core material. As a result, substantial heat is then generated as indicated by the upper curve in FIG. 22. As described above, the catalytic reaction, in combination with the predetermined vacuum maintained within the cavity, creates negative pressure gradients in the direction from an approximate central area of the foamed core 16 toward the fibrous layers 14, 14'. In contrast, and as shown by the lower curve in FIG. 22, a typical polyurethane resin reacts at a significantly slower rate than do the preferred core materials of the present invention.

Please delete Table 1 on page 47.

Please replace the paragraph on page 47 with the replacement paragraph as follows:

In one embodiment of the present invention, the polymeric core material 16 comprises a foaming polyurethane including a blowing agent and a catalyst that promote the relative reaction rates, as measured by the exothermic behavior. The preferred polyisocyanurate system achieves higher temperatures, at a much faster rate, promoting a faster cure cycle as shown typically in FIG. 22. Preferably, the blowing agent comprises a liquid blowing agent that boils upon encountering reduced pressure such as, for example, upon injection into the mold cavity under vacuum. The liquid blowing agent is not necessarily a low-boiling-point blowing agent, but rather is a blowing agent that boils upon encountering reduced pressure. As is known to those of ordinary skill in the pertinent art, such blowing agents do not provide optimal characteristics for insulation

purposes; however, such blowing agents are preferred for use in the present invention for the characteristic described above.

Please replace the last paragraph on page 56 with the replacement paragraph as follows:

Table 1 below provides a description of several embodiments of the polymeric core material 16 of the present invention, including a list of each component and its respective amount.

Please change the title of Table 2 on page 57 to Table 1.

Please replace the last paragraph on page 58 with the replacement paragraph as follows:

Some of the advantages associated with selecting a polyisocyanurate, a blowing agent, and a catalyst as described above for the polymeric core material 16 include an improved modulus stiffness, a higher glass transition temperature, and a significantly reduced cycle time. As shown in FIG. 22, the polyisocyanurate foam rapidly expands upon injection due to the vacuum drawn within the cavity 148. The evacuated

**In the Claims:**

Please cancel claims 58-61 without prejudice.

Cancellation of the claims is made to cancel the elected embodiment indicated as allowable in the parent application. Cancellation of the claims is therefore made without prejudice, and without waiver in any manner as to the right to prosecute such claims, in this application or any subsequent patent application claiming priority from or through this application.

**Remarks**

Claims 1-57 are now pending in this application. Claims 58-61 are canceled herein, without prejudice. Cancellation is not intended, and should not be construed, in any manner to restrict Applicant's right to pursue such canceled claims, or the subject matter thereof, in this application or any application claiming priority from or through this application, or in any reissue, reexamination or similar application which may be filed with respect thereto.

The amendments to the specification are made only to conform the subject application to U.S. patent guidelines. In particular, original Table 1 has been converted into Figure 22 and as such, does not constitute new matter.

In accordance with the 37 C.F.R. § 1.121, the pertinent portions of the amended specification are appended hereto in a version which indicates the amendments. No fee is believed to be required in connection with this paper; however, if an additional fee is required, or otherwise if necessary to cover any deficiency in fees paid, authorization is hereby given to charge our deposit account no. 50-1631. If there are any questions concerning this paper, please contact the undersigned at the telephone number and/or address indicated below.

Respectfully submitted,

By George Chaclas  
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Mark D. Giarratana, Reg. No. 32,615  
Attorney for Applicant

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Phone: (860) 275-6719

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

Please insert a new paragraph with heading, on page 1, after the title as follows:

**--Cross-reference to Related Application**

This application claims priority to and is a divisional of U.S. Patent Application No. 09/690,338 to O'Neill et al., filed October 17, 2000, which is incorporated herein by reference.--

Please insert a new paragraph, on page 11, after the second full paragraph as follows:

--FIG. 22 is a graph illustrating the timing and temperature of the preferred polyisocyanurate core material when undergoing an exothermic reaction upon injection into the core of the composite structure.--

Please replace the last paragraph on page 45 with the replacement paragraph as follows:

Accordingly, the components of the polymeric core material 16 are selected such that upon encountering the reduced pressure in the evacuated cavity 148, the blowing agent begins to boil to thereby pre-expand the polymeric core material from a resinous state to a frothing foam. As indicated in FIG. 22 [Table 1 below], a preferred polymeric core

Please replace the paragraph on page 46 with the replacement paragraph as follows:

material 16, described in further detail below, is a polyisocyanurate that is injected in a resinous state into the cavity 148 at about 85°F. When the polymeric core material 16 encounters the vacuum pressure of the cavity 148, the blowing agent immediately commences boiling and, in turn, causes the foaming resin to promptly fill the second

region of the cavity formed between the fibrous layers 14, 14'. As further indicated in [Table 1] FIG. 22, in less than approximately one minute, the exothermic reaction produces sufficient heat to raise the temperature of the polymeric core material 16 to about 140°F and, in turn, activate the latent catalyst and initiate a catalytic reaction within the core material. As a result, substantial heat is then generated as indicated by the upper curve in [the Table] FIG. 22. As described above, the catalytic reaction, in combination with the predetermined vacuum maintained within the cavity, creates negative pressure gradients in the direction from an approximate central area of the foamed core 16 toward the fibrous layers 14, 14'. In contrast, and as shown by the lower curve in [Table 1] FIG. 22, a typical polyurethane resin reacts at a significantly slower rate than do the preferred core materials of the present invention.

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In one embodiment of the present invention, the polymeric core material 16 comprises a foaming polyurethane including a blowing agent and a catalyst that promote the relative reaction rates, as measured by the exothermic behavior. The preferred polyisocyanurate system achieves higher temperatures, at a much faster rate, promoting a faster cure cycle as shown typically in [Table 1 above] FIG. 22. Preferably, the blowing agent comprises a liquid blowing agent that boils upon encountering reduced pressure such as, for example, upon injection into the mold cavity under vacuum. The liquid blowing agent is not necessarily a low-boiling-point blowing agent, but rather is a blowing agent that boils upon encountering reduced pressure. As is known to those of ordinary

skill in the pertinent art, such blowing agents do not provide optimal characteristics for insulation purposes; however, such blowing agents are preferred for use in the present invention for the characteristic described above.

Please replace the last paragraph on page 56 with the replacement paragraph as follows:

Table 1 [2] below provides a description of several embodiments of the polymeric core material 16 of the present invention, including a list of each component and its respective amount.

Please change the title of Table 2 on page 57 to Table 1.

Please replace the last paragraph on page 58 with the replacement paragraph as follows:

Some of the advantages associated with selecting a polyisocyanurate, a blowing agent, and a catalyst as described above for the polymeric core material 16 include an improved modulus stiffness, a higher glass transition temperature, and a significantly reduced cycle time. As shown [above in Table 1] in FIG. 22, the polyisocyanurate foam rapidly expands upon injection due to the vacuum drawn within the cavity 148. The evacuated